Battle of Neighborhoods

Restaurant competition in New York

Introduction

Restaurants are a notoriously difficult business to own or operate. Not only is it a relatively capital and employee-intensive business, restaurants are also highly regulated, low margin and in most cases have a plethora of competition to deal with. There are more dining establishments and more diners now than during any other time in history; the National Restaurant Association reports over 1 million restaurant locations in the U.S. alone, a particular boon considering more than half the American population visits at least one of them each week. To fill a niche and remain relevant, prospective, as well as established, restaurants have to hedge their bets with well-rounded and well-directed dataset. Data science provides valuable insights regarding market trends and evolving consumer lifestyles so that restaurateurs can better address and meet public demand.

Business Problem

No single restaurant is ever going to appeal to everyone. Some people like quiet, intimate settings; others prefer boisterous ones. Some people want to bring their kids along; others want to dine alone. The preferences are as varied as the possible offerings, with specific generational cohorts preferring one thing, "people who like Indian food" preferring another and everyone else is liking a million other things in between.

My client, a successful Indian restaurant chain in Malaysia is looking to expand operation into North America through New York (NYC).

Problem Statement

To locate and recommend to the client which neighborhood in New York City will be best choice to start a restaurant.

The problem which I plan to use Foursquare location data to solve the following: I plan to use the Foursquare API to help a Restaurant owner to locate the neighborhoods in the New York area which have the most competition. Such a program would allow him/her to discover the neighborhoods which should be avoided when setting up , since these areas have a high frequency of Indian restaurants already. Thus, there may be high saturation in those markets for Indian restaurants. This would greatly benefit a new owner who is unfamiliar to the geography of the New York area. Rather than finding the number of Restaurants manually, they can sort and map using the Foursquare location API.

Data

The data being used will be two fold. First, data will be taken about the geographical coordinates of each neighborhood in New York; it will be narrowed down to include only Toronto neighborhoods. This data will be taken from a postal code/neighborhood database. The postal codes will be converted to longitude and latitude coordinates so that they may be analyzed in the Foursquare API. The Foursquare API can then be used to find the frequency of various venues near each of the identified neighborhoods. The neighborhoods will then be sorted based on the frequency of Restaurants in particular and then they will be clustered together based on similarity in this frequency. Then, the areas with the highest frequency of Restaurant presence will be isolated and displayed on a map, with name labels for the user to identify.

Before opening a new restaurant in NYC, the data science team will provide data and insight to:-

- Part 1: NYC Population & Demographic characteristics

Datasource:https://en.wikipedia.org/wiki/New_York_City ; https://en.wikipedia.org/wiki/Demographics_of_New_York_City.
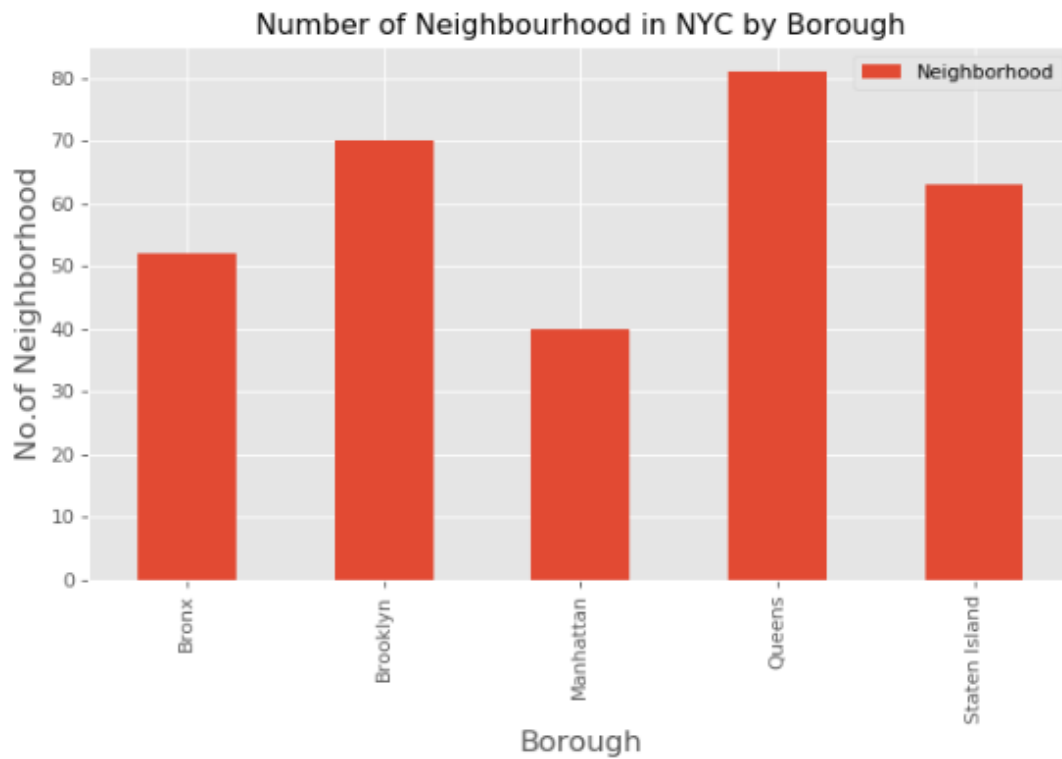
Web scraping techniques was used to get NYC's population density and demographics data from Wikipedia. Preliminary finding indicates that Queens being the second most populous urban area in New York City (NYC), behind Brooklyn; and the most ethnically diverse urban area in NYC with the highest Asian ethnic minority population.

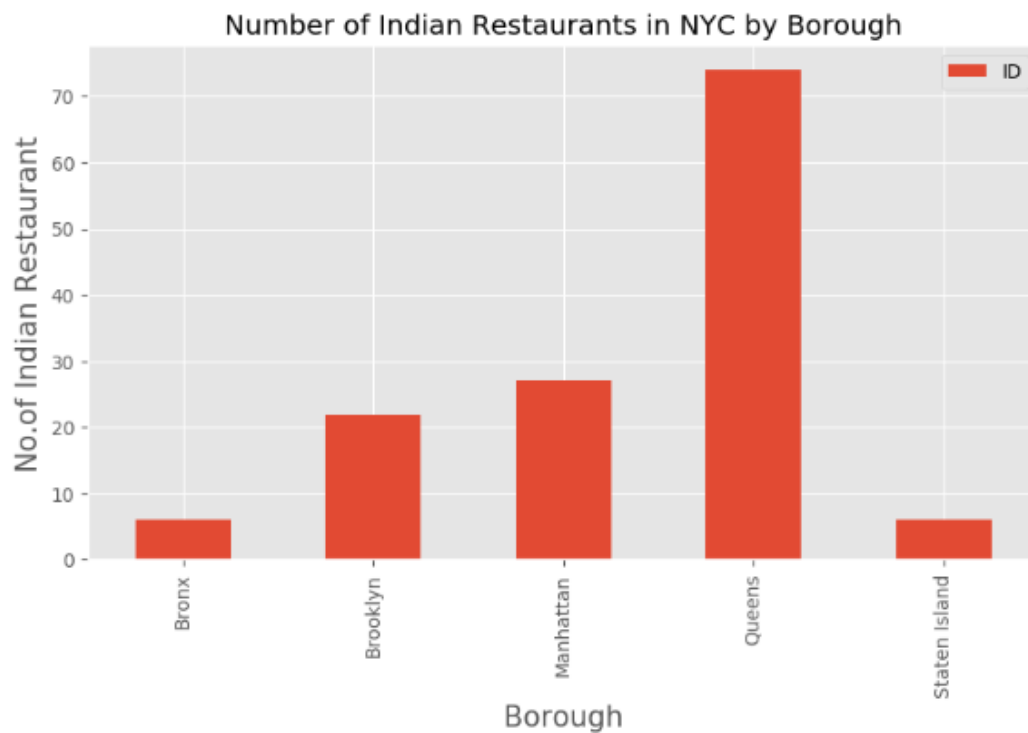- Part 2: Who are the competitors in that location?

Data source: https://cocl.us/new_york_dataset and Foursquare API.

These dataset was used to explore various neighborhoods and each Indian restaurants venue in the neighborhood.
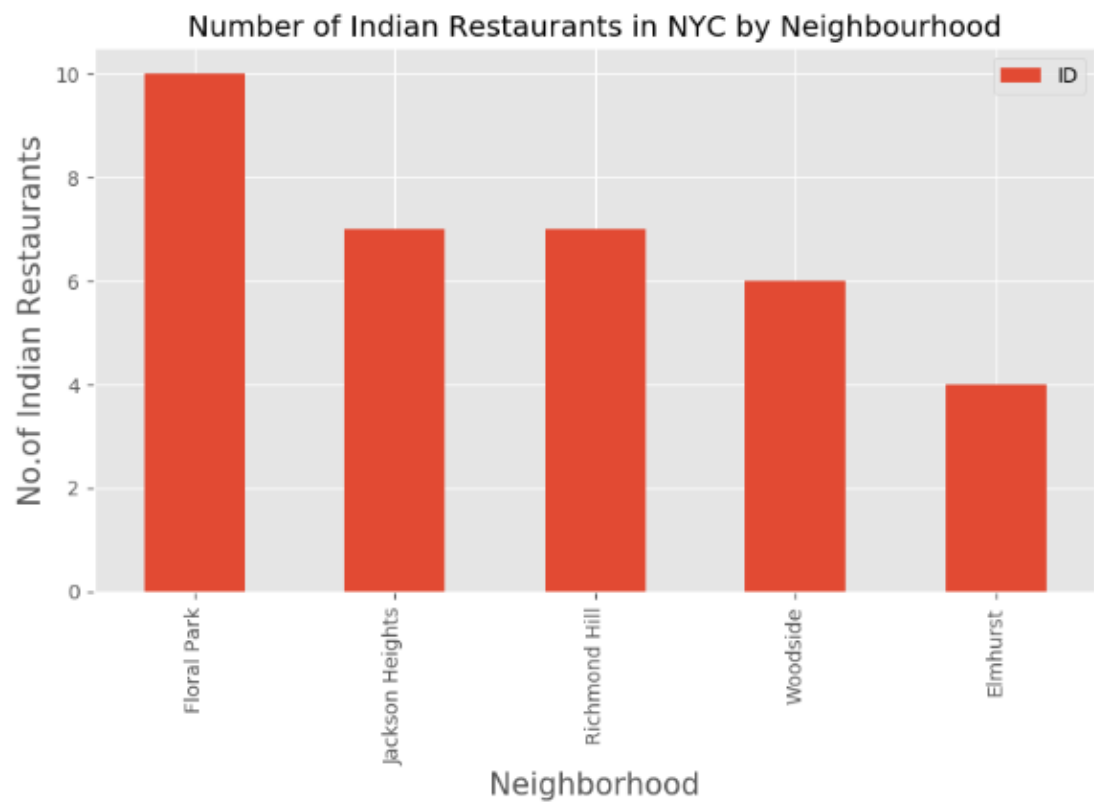
Based on the data, Queens is the most densely populated borough in New York City with 80 neighborhoods
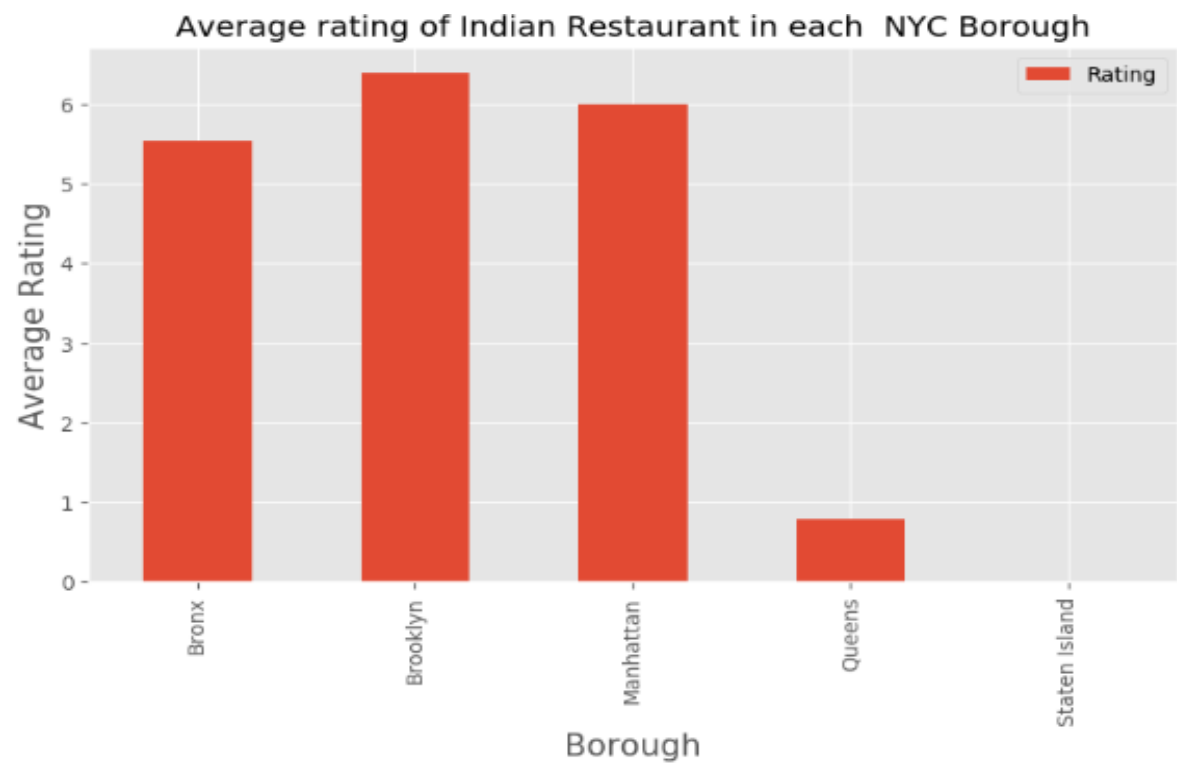
Number of Neighbourhood in NYC by Borough

It is noted that Queens has the highest number of Indian Restaurants.

Number of Indian Restaurants in NYC by Borough

Floral Park in Queens has the most Indian Restaurants with a total count of 10.

Number of Indian Restaurants in NYC by Neighbourhood

Brooklyn has the highest average rating for Indian Restaurants.

Average rating of Indian Restaurant in each NYC Borough

All the neighborhoods with average rating greater or equal 8.0 to be visualized on map

	Borough	Neighborhood	Latitude	Longitude	Average Rating
14	Manhattan	Tribeca	40.721522	-74.010683	9.10
0	Queens	Astoria	40.768509	-73.915654	8.85
9	Queens	Murray Hill	40.764126	-73.812763	8.80
11	Brooklyn	Prospect Heights	40.676822	-73.964859	8.80
8	Manhattan	Murray Hill	40.748303	-73.978332	8.80
5	Brooklyn	Fort Greene	40.688527	-73.972906	8.70
3	Brooklyn	Clinton Hill	40.693229	-73.967843	8.70
6	Manhattan	Gramercy	40.737210	-73.981376	8.60
13	Brooklyn	South Side	40.710861	-73.958001	8.50
12	Manhattan	Roosevelt Island	40.762160	-73.949168	8.40

Preliminary findings

Queens is the second most populous urban area in New York City (NYC), behind Brooklyn.

However, with that being said, it is the most ethnically diverse urban area in NYC with the highest Asian ethnic minority population.

Despite the fact that Manhattan is the third most populous urban area in New York City (NYC), it has a population density of 27826 people per square km, making it highest of any borough in the United States.

It has the second highest Asian ethnic minority population in NYC.

	jurisdiction	%_white	%_black_or_african_amercian	%_Asian	%_other	%_mixed_race	%_hispanic_latino_of_other_race
0	Queens	44.1	20.0	17.6	12.3	6.1	25.0
1	Manhattan	54.4	17.4	9.4	14.7	4.1	27.2
2	Bronx	29.9	35.6	3.0	25.7	5.8	48.4
3	Staten Island	77.6	9.7	5.7	4.3	2.7	12.1
4	NYC Total	44.7	26.6	9.8	14.0	4.9	27.0

Findings

1. Tribeca in Manhattan, Astoria and Murray Hill in Queens are some of the best neighborhoods for Indian cuisine.
2. Queens has the lowest rated Indian Restaurants in NYC.
3. Manhattan is the best place to stay if you prefer Indian Cuisine.

Conclusion

Tribeca or Murray Hill in Manhattan would be the best choice to start an Indian restaurant given that:-

1. It is one of the most densely populated urban areas in New York City (NYC).
2. It has a population density of 27826 people per square km, highest of any borough in the United States.
3. It has the second highest Asian ethnic minority population in NYC.
4. It has some of the top rated Indian restaurants located in that area (i.e. ready-made customer base).